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UNITING AVIATION

# ATFM

In the  
Asia/Pacific Region

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ICAO Asia/Pacific Regional Office (Bangkok)*

ICAO Air Traffic Flow Management Seminar

Dubai, UAE, 13-15 December 2016





# Topics ....

- The Challenge
- APAC Regional ATFM Concept of Operations
- APAC Regional Framework for Collaborative ATFM
- Current Regional Status and Activities
- Future Developments





# The Challenge



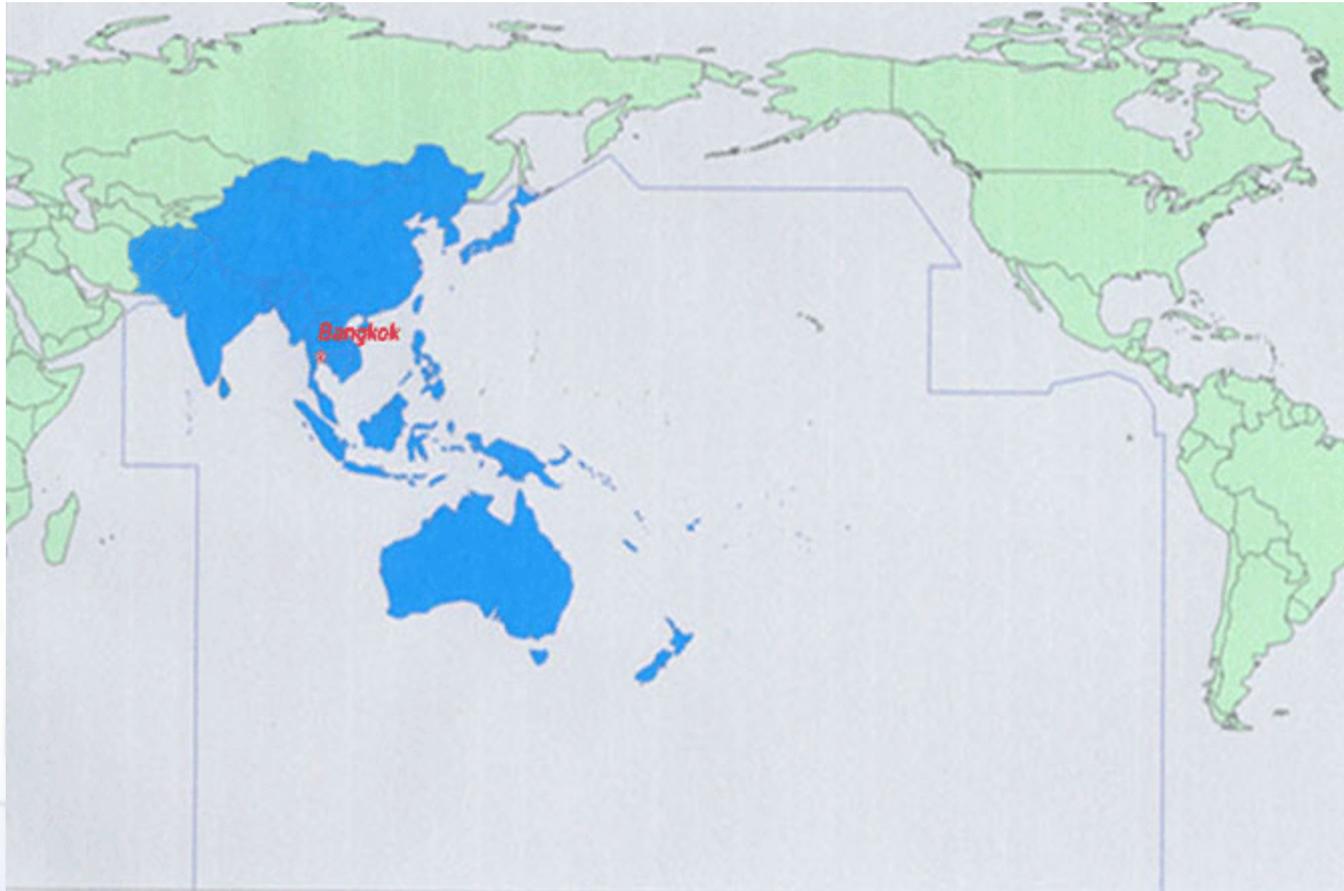


- The ICAO Asia/Pacific Region
  - 38 States
  - 2 Special Administrative Regions of China
  - 2 States accredited to other Regional Offices
    - USA (Oakland Oceanic FIR)
    - France (French Polynesia)
  - 50 FIRS
- World's largest ICAO Region
  - Geographically
  - Passengers
  - Traffic movements





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- **Traffic Demand and Capacity Constraints**
  - East Asia and Northeast Asia
    - China, Japan, Republic of Korea
    - Very high rate of traffic growth in China
      - Mainly LCC using narrow-body jets
  - South East Asia
    - Also very high rates of traffic growth
    - Many high density FIRs and city pairs
    - High density traffic operating in narrow corridors
      - Archipelagos (Indonesia, Philippines)
  - South Asia and inter-regional





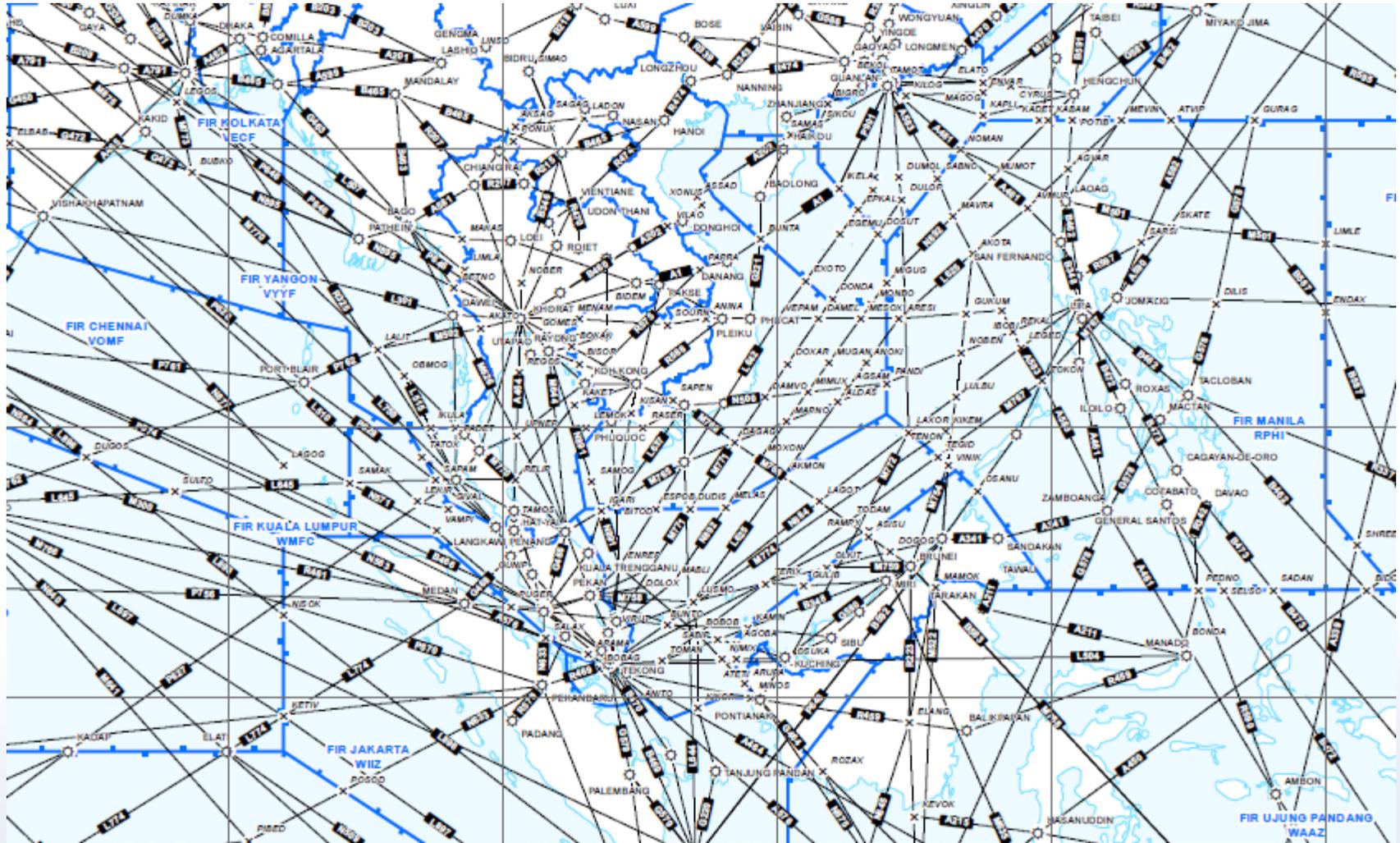
- Traffic Demand and Capacity Constraints
  - Many small FIRs with short transit times
  - Large volumes of Special Use Airspace
    - Little civil-military cooperation
  - Some domestic ATFM implementation
  - Little effective ATC Centre-to-Centre automation
  - No network management facility







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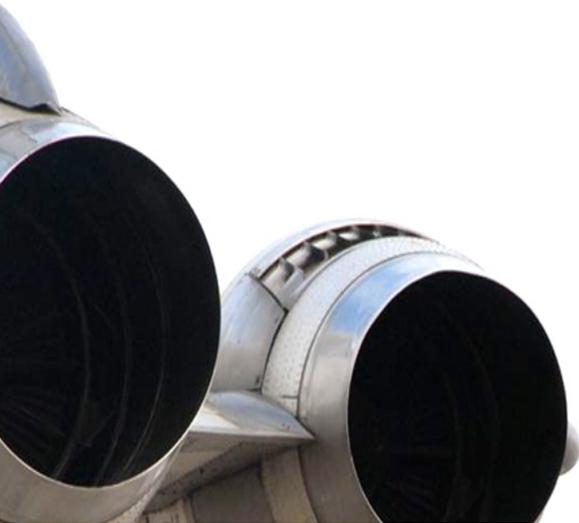
- Traffic Demand and Capacity Constraints
  - Overly conservative ATC separations and procedures
  - ATM automation systems not fully implemented
    - E.g. paper strips, no AIDC, automated coordination/handoff not fully implemented
  - Special Use Airspace/lack of civil-military cooperation
  - Runway and airport capacity limitations

**“Increased capacity is the primary and central method for management of increasing demand.”**

*Asia/Pacific Regional Framework for Collaborative ATFM – Collaborative ATFM Principles.*



# APAC Regional ATFM Concept of Operations





- Regional ATFM  
Concept of Operations
- Initially developed by CAA Singapore
  - Collaboration with Industry and Research partners
- Adapted by APAC ATFM/SG
- Supports the Regional ATFM Framework
- Adopted by APANPIRG/26
  - September 2015

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC REGIONAL  
AIR TRAFFIC FLOW MANAGEMENT  
CONCEPT OF OPERATIONS

Version 1.0 September 2015

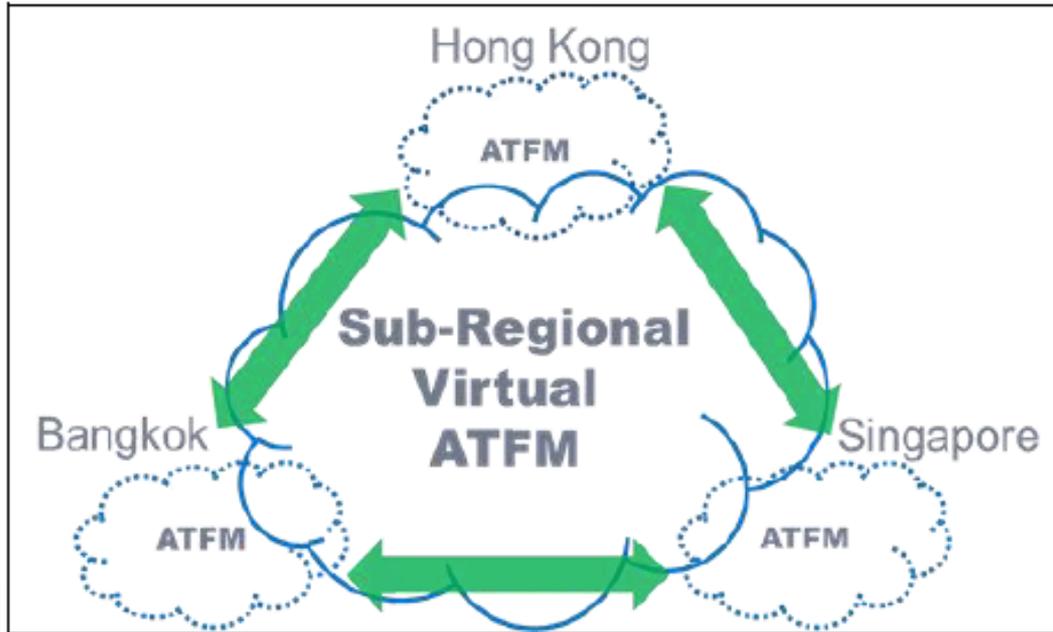
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Approved by APANPIRG/26 and published by the  
ICAO Asia and Pacific Office, Bangkok



- **Key Concepts**
- *Distributed multi-nodal ATFM network*

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REGIONAL  
TRAFFIC MANAGEMENT  
OPERATIONS

September 2015

the Asia/Pacific Air Traffic Flow  
Management Group (ATFM/SG)

2015/26 and published by the  
Regional Office, Bangkok



- **Key Concepts**
- *Distributed multi-nodal ATFM network*
- *“A virtual ATFM platform of interconnected States and or sub-Regional groups operating an ATFM network”*
- *No central network management*

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- **Key Concepts**

- *Delay absorption intent*

- Distributes delay through various phases of flight

- Delay intent fields

- Ground (gate) delay intent
- Airport surface delay intent
- Airborne delay intent





Civil Aviation Authority of Singapore - Windows Internet Explorer

caas-affm

Civil Aviation Authority of Singapore

**CAAS** Major: TGW 12 Flights Affected TMI Start Time: 2013-08-15 0700 UTC  
TMI End Time: 2013-08-15 1000 UTC

ACID	From	SOBT	TMI Delay	Gate Delay	ARPT Surface Delay	Airborne Delay
TGW2133	VHHH	0400	0	0	0	0
TGW2133	VTSS	0430	20	0	0	20
TGW2783	RPVM	0435	25	0	0	25
TGW2639	VOMM	0500	<b>25</b>	<b>10</b>	<b>5</b>	<b>10</b>
TWG2105	VTBS	0630	25	25	0	0

Reset Submit

Internet | Protected Mode On 100%





- **Other Concepts**
- Maximum Delay
- Slot swapping
- Compliance
- Post-Operations Analysis
- A-CDM interoperability

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- Regional ATFM  
Concept of Operations
- Available on the ICAO  
Asia/Pacific Regional Office  
eDocuments web-page
- ICAO APAC eDocuments  
web-page
- APAC ATFM Concept of  
Operations

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# APAC Framework for Collaborative ATFM





- APANPIRG/24 (June 2013)
  - Considered ATFM needs in APAC Region
    - A centralized ATFM approach for APAC? - **Impracticable**
    - More pragmatic to support sub-regional multi-State programs
    - Adopted several ATFM related conclusions





- **APANPIRG/24 (June 2013)**
  - **Conclusion 24/13: Air Traffic Flow Management Capacity Assessments**
    - (urging States to establish capacity assessment and adjustment mechanisms and report to Regional Office by 1 May 2014)
  - **Conclusion 24/14: Air Traffic Flow Management Information Sharing**
    - (urging States to share capacity assessments and factors affecting capacity, traffic demand information, and ATFM Daily Plan)





- **APANPIRG/24 (June 2013)**
  - **Conclusion 24/15:** Asia/Pacific ATFM Steering Group  
*That, States participate in, and support the Asia/Pacific ATFM Steering Group to **develop a common Regional ATFM framework**, which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific region*





- Asia/Pacific Framework for Collaborative ATFM
- Developed by APAC Air Traffic Flow Management Steering Group (ATFM/SG)
- Adopted by APANPIRG/26
  - September 2015

Asia/Pacific Framework for Collaborative ATFM

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

Version 2.0 September, 2016

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Administered by ICAO HQ

**Global Vision**  
Global Air Traffic Management Operational Concept (Doc 9854)

**Global Reporting**  
Global Air Navigation Report  
Global Air Safety Report

**Global Strategy**  
Global Air Navigation Plan (Doc 9750)  
Global Aviation Safety Plan (Doc 10004)

**Regional Reporting**  
Asia/Pacific Regional Dashboard

Administered by ICAO Regional Office

**Regional Vision**  
Asia/Pacific Region Air Navigation Plan (Doc 9763)

**Regional Implementation Monitoring**  
Asia/Pacific Regional Picture

**Regional Implementation Strategy**  
Asia/Pacific Seamless ATM Plan  
(incorporated into eANP Vol. III), including:

- Asia/Pacific Regional ATFM Framework
- Regional ATM Contingency Plan (draft)
- Asia/Pacific Search and Rescue Plan
- AMS, NAV and SUR strategies

**Regional Implementation Reporting**  
Seamless ATM Reporting

**Regional Guidance Material**  
Seamless ATM Guidance Material  
State Seamless ATM Plan Template





- Asia/Pacific Framework for Collaborative ATFM
- References the ATFM Concept of Operations
- Aligned with ICAO Doc 9971 – *Manual on Collaborative ATFM* (Second Edition 2014)

Asia/Pacific Framework for Collaborative ATFM

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ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

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- Asia/Pacific Framework for Collaborative ATFM
- Includes *inter alia*:
  - Background information and guidance
  - Analysis of current situation (2014-2015)
  - Performance Improvement Plan for Regional ATFM Capability
    - Phase IA expected implementation 12 November 2015
    - Phase IB expected implementation 25 May 2017
    - Phase II expected implementation 8 November 2018



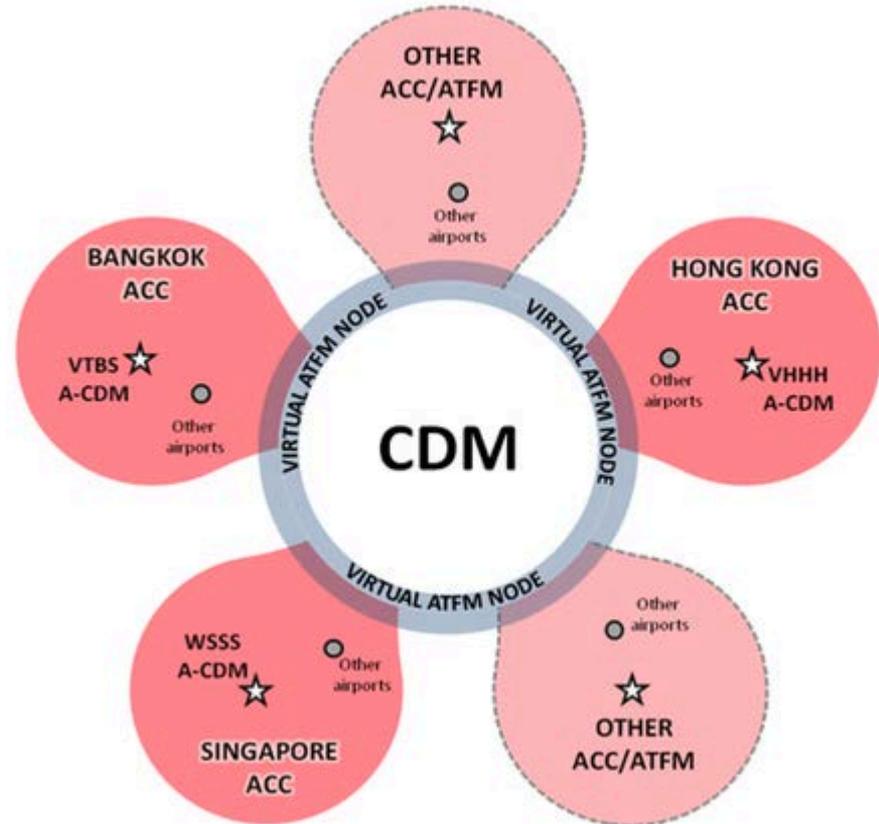


- Asia/Pacific Framework for Collaborative ATFM
- Performance Improvement Plan
  - Each phase has objectives for
    - ATFM Regulations
    - ATFM Systems
    - Strategic, Pre-Tactical ATFM or Tactical ATFM
      - Capacity/Demand Monitoring and Analysis
      - Capacity Improvement
      - ATFM Execution
      - ATFM Measures
      - Post-Operations Analysis



- Asia/Pacific Framework for Collaborative ATFM
- Key inclusions
  - Core concept:

## Distributed Multi-Nodal ATFM Network





- Asia/Pacific Framework for Collaborative ATFM
- **Key inclusions**
  - ATFM terminology and communications
  - Agreed Information Exchange Model (FIXM)
  - Tiered participation levels (example for trials)
  - MET information for ATFM
  - ATFM Daily Plan template
  - ATFM Training Requirements





- Asia/Pacific Framework for Collaborative ATFM
- Available on the ICAO Asia/Pacific Regional Office eDocuments web-page
- ICAO APAC eDocuments web-page
- APAC Regional Framework for Collaborative ATFM

Asia/Pacific Framework for Collaborative ATFM

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ASIA/PACIFIC FRAMEWORK

FOR

COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT

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# Current Regional Status and Activities





- **Current Regional Status and Activities**
  - Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT)
    - AEROTHAI and participating ANSPS/Airlines
  - Multi-Nodal ATFM Trial
    - Australia, China, Hong Kong China, Indonesia, Malaysia, Singapore, Thailand, CANSO, IATA
  - North Asia Region ATFM Harmonization Group (NARAHG)
    - China, Japan, Republic of Korea



- Current Regional Status and Activities
  - Other activities
    - Mini-Global Trial (Singapore/Thailand)
    - Collaborative miles-in-trail conversion program (China/Thailand)
    - Combined ATFM Measures
      - Multi-nodal trial partners





- Current Regional Status and Activities
  - APAC Meteorological Requirements Working Group (MET/R WG)
    - Developing guidance for MET information for ATM
    - Joint working sessions with ATFM/SG
  - APAC A-CDM Task Force (APA-CDM/TF)
    - First meeting April 2017 (tentative)
  - APAC Common Aeronautical VPN Task Force/Operations Group (CRV/TF → CRV OG)
    - Implementation of a common virtual private network for aeronautical communications





- Current Regional Status and Activities
  - More information available on the APAC Regional Office website:
  - [ICAO APAC Meetings Web-page](#)





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# Future Developments in APAC ATFM





- Future Developments in APAC ATFM
- Operational Requirements Document/Interface Control Document (ORD/ICD)
  - ATFM/SG project
  - Information exchange: what, who, where, when and how
  - Early stage of development
  - Using Multi-Nodal ATFM Trial experience
    - Major input from Trial Technical Sub-Group





- Future Developments in APAC ATFM
- Collaborative ATFM Concept Developments
  - Delay absorption intent
  - ATFM for long-range flights
  - Interoperability of ATM, ATFM, AMAN/DMAN and A-CDM systems
  - Collaborative Trajectory Options





- Future Developments in APAC ATFM
- Network Collaborative Decision-Making
  - Executive flow management decisions in the event of competing stakeholder priorities
  - Network-suitable automated decision support tools/business rules
  - Operational experience to identify potential challenges, formulate and test strategies





QUESTIONS?





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Mexico City

South American  
(SAM) Office  
Lima

ICAO  
Headquarters  
Montréal

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Central African  
(WACAF) Office  
Dakar

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Southern African  
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THANK YOU

*Aviation is safe because it has the culture to learn and react*

<http://www.icao.int/safety/globaltracking>